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DELAWARE COLLEGE BULLETIN
NEW SERIES

Volume III

JULY, 1907

Number IV

PUBLISHED QUARTERLY

DELAWARE COLLEGE

NEWARK, DELAWARE



UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

Agricultural Course

and

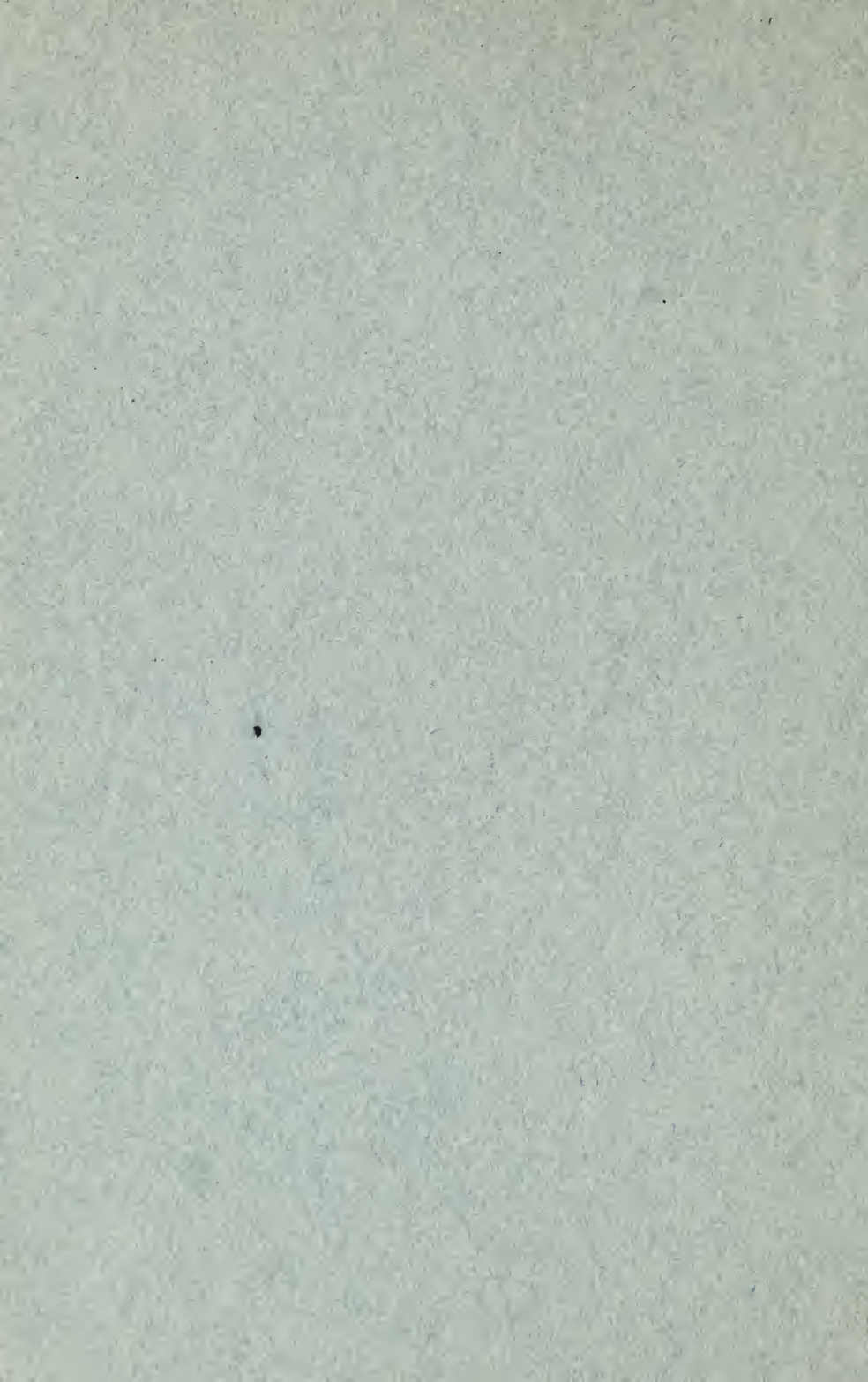
Staff of Instructors

1907-1908

PUBLISHED BY DELAWARE COLLEGE

Entered June 22, 1904, at Newark, Delaware, as second class matter, under Act of
Congress of July 16, 1894

Delaware College. 1907-08



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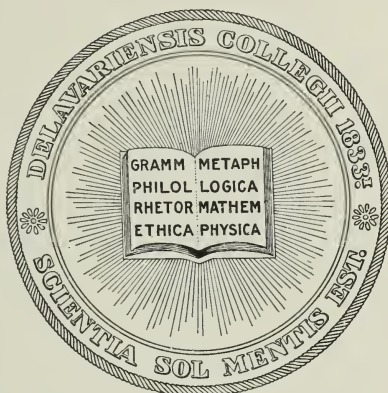
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The following is a list of the Professors engaged
in Agricultural teaching specifically.



GEO. A. HARTER, Ph. D., *President*

HARRY HAYWARD, M. S., *Professor of Animal Industry and Dean
of the Department.*

CHARLES L. PENNY, M. A., *Professor of Agricultural Chemistry*

CLINTON O. HOUGHTON, B. A., . . . *Professor of Zoology*

CHAS. F. DAWSON, M. D., D. V. S., *Professor of Veterinary Science*

CHARLES A. McCUE, B. S., . . . *Professor of Horticulture*

MELVILLE T. COOK, Ph. D., . . . *Professor of Botany*

ARTHUR E. GRATHAM, B. A., B. S. A., . *Professor of Agronomy*

HERBERT S. JACKSON, B. A., . . . *Instructor in Botany*



FOR CATALOGUES OF THE COLLEGE, OR OTHER INFORMATION WRITE TO
GEO. H. HARTER, PRESIDENT, OR TO HARRY HAYWARD, DEAN OF THE AGRICULTURAL
DEPARTMENT.



THE USE OF MODERN MACHINERY SAVES TIME AND HIGH PRICED LABOR

The Agricultural Courses of Delaware College.

The courses in Agriculture at Delaware College have been completely reorganized, and it has been thought well to publish, in bulletin form, a statement of the courses now offered, and the opportunities now open to young men for Agricultural instruction at the institution.

It is a well recognized fact that, considered pedagogically, all conditions being similar, instruction in Agriculture is equal, as a means of mental development, to any other of the applied sciences. It also has the further advantage of appealing in some of its many phases to almost every young and alert mind, and this interest is held by many throughout life. The very fact that so many successful men are turning their attention to Agriculture in some form or other, together with the great advance that has been made within the past decade in bringing farm operations to a greater degree of exactness, has created a demand for men trained in Agricultural science as teachers and investigators along Agricultural lines, as well as managers of farms and estates for non-resident owners.

The remuneration commanded by persons competent to fill these positions satisfactorily compares favorably with that of men trained in engineering, law, medicine, or almost any of the so called learned professions. This may be illustrated by noting the positions now held by a few of the writer's former students. Mr. A. is a Bacteriologist at a salary of \$2,200, with an opportunity of steady advancement. Mr. B. was a short course dairy student who became interested in Veterinary Science, attended a Veterinary school, and is now an investigator in this line of work at a salary of \$1,500 per year. Mr. C. is a teacher in an Agricultural school at \$1,200 per year. Mr. D. is Assistant Professor of Animal Industry in one of the State Universities. Mr. E., a two year student, superintends the farm at another State College. Mr. F., a short course student, is head butter-maker at a good salary in a large creamery in a neighboring State. A number of others are successfully managing their own farms. These are but a few of the many students in Agri-

culture that the writer has had the privilege of meeting in the classroom and laboratory, and are mentioned merely to show that, other things being equal, the opportunities in Agriculture to-day are as numerous and attractive as in any other vocation.

If one expects to manage a farm for himself, there never was a time when the need of a thorough training at a recognized School of Agriculture was more keenly felt.

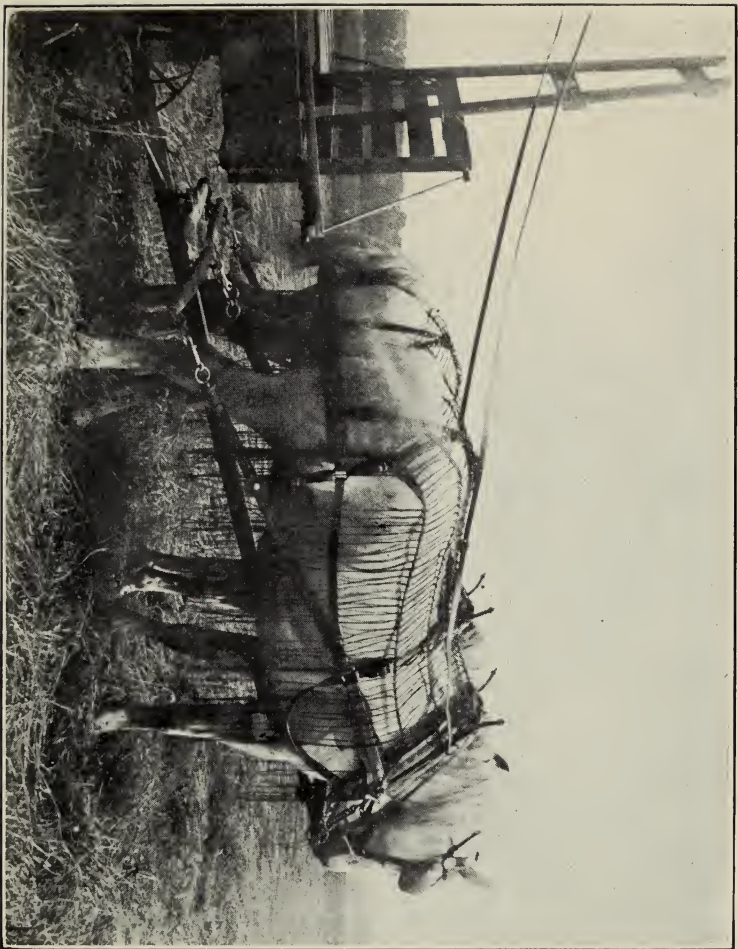
It will be readily seen, then, that a systematic training in Agriculture is essential to success in farming, and that no young man who expects to spend his life in the country can afford to allow the opportunity afforded him by his Agricultural College to go by unembraced.

Delaware College has offered instruction in Agriculture since 1872, but not until recently has it been possible to obtain a modern equipment for this department of the institution that would compare with the Agricultural equipment in other State Colleges.

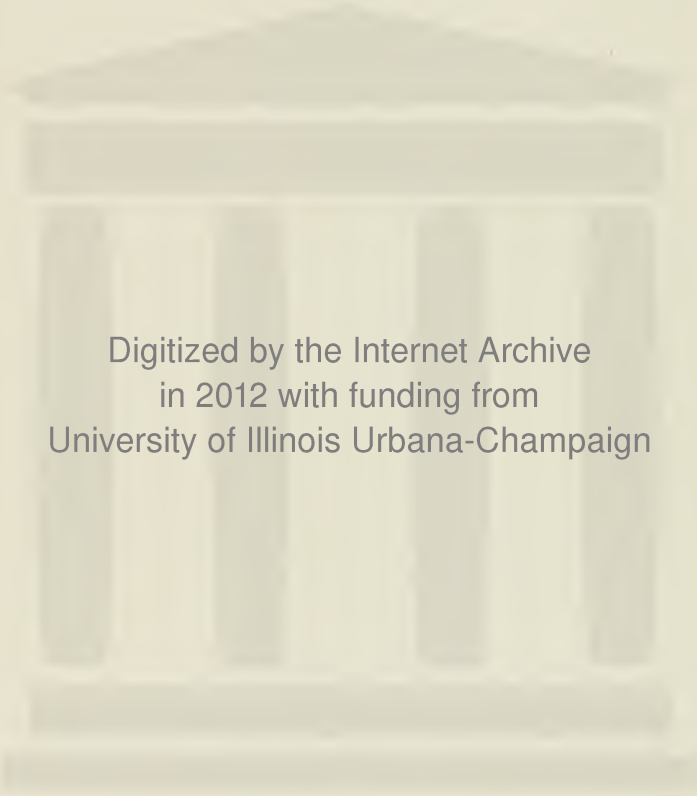
With the presentation of a farm through the foresight and generosity of the Legislature of 1907, and the equipment that is being rapidly gathered, the College is in a better position than ever before to provide instruction in Agriculture for the young men of the Commonwealth.

The farm consists of over two hundred acres of varying kinds of soil. It has been divided into fields containing approximately 25 acres each. Two of the best of these have been set aside for the use of the Horticultural Department. One is designed for small fruits, vegetables and a variety orchard; the other will be used for testing the value of various methods of treatment of commercial orchards. Another twenty-five acres will be used exclusively by the Agronomist in his work in determining the comparative worth of different kinds of soil treatment in its improvement, the value of various cover crops compared with barn yard manure, and the rotation of crops with the use of artificial manure in increasing soil fertility; and the testing of newly introduced plants. About thirty acres are covered with a very good growth of timber, which will be improved by the latest methods of caring for wood lots. The remainder of the farm will be devoted to experiments with field crops on a commercial scale, and to experiments with live stock.

Plans for a new barn with modern conveniences and appliances are completed, and it is expected that it will be ready for use soon after the first of the calendar year. Other buildings, such as green houses, packing sheds, etc., are to be added from time to time as they are needed, and as funds will permit.



THE RAISING OF DRAFT HORSES MIGHT INCREASE MATERIALLY THE INCOME ON DELAWARE FARMS. A PAIR OF IMPORTED PERCHERON BROOD MARES



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The farm is equipped with modern tools and machinery, special care having been exercised to make this part of the equipment as valuable from an educational point of view as possible. Neither time nor money has been spared in equipping the farm with horses, and the educational value of each purchase has been carefully considered. The result is that there is now on the farm, available for use in the class-room, choice specimens of pure bred Percheron and Hackney horses, as well as specimens of the Cotton type of mules. A good sized herd of pure bred cattle, a small flock of sheep and a small herd of swine, will be added to the farm equipment as soon as the new barn is completed.

Courses of Instruction..

Delaware College offers four courses of instruction in Agriculture

1. A four years Collegiate course leading to the degree of B. S. in Agriculture.
2. A four years course for young men sixteen years of age or older, who have a common school education.
3. A two years special course, largely elective, for young men of sixteen years or over, who have a common school training.
4. A short winter course of eight weeks, open to young men sixteen years of age.

The schedule of these courses, as far as they can be outlined, is as follows :

Four Years Course in Agriculture.

LEADING TO A DEGREE.

Freshman Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS	HOURS PER WEEK	SUBJECTS	HOURS PER WEEK
English	4	English	4
Mathematics	5	Mathematics	5
French or German	2	French or German	2
Chemistry	3	Chemistry	3
Botany	3	Botany	3
Shop	7	Agronomy	4
Military Drill	3	Military Drill	3

Sophomore Year.

FIRST YEAR.		SECOND TERM.	
SUBJECTS	HOURS PER WEEK	SUBJECTS	HOURS PER WEEK
English	3	Agronomy	3
Agricultural Chemistry	3	Agricultural Chemistry	3
French or German	2	French or German	2
Biology	3	Biology	3
Botany	3	Botany	3
Horticulture	3	Horticulture	3
Military Drill	3	Military Drill	3

Junior Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS.	HOURS PER WEEK	SUBJECTS.	HOURS PER WEEK.
Physics	3	Physics	3
French or German	2	French or German	2
Agronomy	3	English	3
Logic	1	Logic	1
Military Drill	3	Military Drill	3
ELECTIVE		ELECTIVE	
Animal Husbandry	3	Animal Husbandry	3
Bacteriology	5	Veterinary Science	5
OR		OR	
Botany	3	Botany	3
Horticulture	3	Horticulture	3
Geology	2	Geology	2
		Forestry	3

Senior Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS.	HOURS PER WEEK.	SUBJECTS.	HOURS PER WEEK.
Agricultural Economics	2	Agricultural Economics	2
Sanitary Science	1	Sanitary Science	1
Agronomy	3	Agronomy	2

SUBJECTS.	HOURS PER WEEK.	SUBJECTS.	HOURS PER WEEK.
Psychology	3	Ethics	3
Military Drill	3	Military Drill	3
Animal Husbandry	3	Animal Husbandry	3
Horticulture	2	Horticulture	3
Agronomy	2	Thesis	2
Farm Management	2		

Four Years Course in Agriculture.

FOR STUDENTS 16 YEARS OF AGE OR OLDER, WHO HAVE HAD A
COMMON SCHOOL EDUCATION.

First Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS	HOURS PER WEEK	SUBJECTS	HOURS PER WEEK
Mathematics	5	Mathematics	5
History	3	History	3
English	4	English	4
Elementary Science	5	Botany	3
Military Drill	3	Animal Husbandry	3
		Military Drill	3

Second Year.

FIRST TERM		SECOND TERM.	
SUBJECTS	HOURS PER WEEK	SUBJECTS	HOURS PER WEEK
Mathematics	3	Mathematics	3
English	3	English	3
Elocution	2	Shop	7
History	3	Botany	3
Botany	3	Biology	3
Horticulture	3	Horticulture	3
Military Drill	3	Military Drill	3

Third Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS,	HOURS PER WEEK.	SUBJECTS.	HOURS PER WEEK.
Surveying	3	Physics	3
English	3	English	3
Horticulture	3	Horticulture	3
Agronomy	3	Agronomy	3
Animal Husbandry	3	Animal Husbandry	3
Chemistry	3	Chemistry	3
Military Drill	3	Military Drill	3

Fourth Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS.	HOURS PER WEEK.	SUBJECTS.	HOURS PER WEEK.
Agricultural Chemistry	3	Agricultural Chemistry	3
English	3	English	3
Horticulture	3	Horticulture	3
Agronomy	3	Agronomy	3
Animal Husbandry	3	Dairying	3
Veterinary Science	5	Bacteriology	5
Military Drill	3	Military Drill	3

Two Years Course in Agriculture.

First Year.

FIRST TERM.		SECOND TERM.	
SUBJECTS	HOURS PER WEEK	SUBJECTS	HOURS PER WEEK
English	3	English	3
Chemistry	3	Chemistry	3
Military Drill	3	Military Drill	3
Elective		Elective 11 hours from :	
12 hours from :		Botany	
Botany		Horticulture	
Horticulture		Animal Industry.	
Animal Husbandry		Agronomy	



DELAWARE GRASS LANDS RESPOND PROFITABLY TO A RATIONAL USE OF COMMERCIAL FERTILIZER

SUBJECTS.	HOURS PER WEEK.
Agronomy	
Veterinary Science	
Bacteriology	

SUBJECTS.	HOURS PER WEEK.
Veterinary Science	
Bacteriology	

Second Year.

FIRST TERM		SECOND TERM.	
SUBJECTS	HOURS PER WEEK	SUBJECTS	HOURS PER WEEK
English	3	English	3
Agricultural Chemistry	3	Agricultural Chemistry	3
Military Drill	3	Military Drill	3

Elective, 12 hours from below :

Botany
Horticulture
Animal Husbandry
Agronomy
Agricultural Economics.

Agronomy.

1. *Soil Physics.*—A study of the origin, formation, classification and function of soils; the relation of soil texture to temperature, air and moisture, and to plant growth; the effect of methods of tillage and drainage on the physical properties of soils. Lectures and recitations. One laboratory period per week. *Three periods. First term.*

2. *Soil Fertility.*—The relation of plant food to the productive capacity of the soil and a study of the methods by which the fertility may be maintained and increased. The ultimate effect of various rotations and of different systems of farming on the fertility of soil. A study of the composition of manures, fertilizers and amendments with a comparison of their agricultural and commercial value for different crops. Lectures, recitations, and laboratory work. *Three periods. Second Term.*

3. *Field Crops*.—The cultivation, harvesting and marketing of field crops. Attention in detail is given to the various methods of production and to cost. Varieties and types of field crops are considered, together with the principles of improvement by selection and breeding. Lectures, recitations, and laboratory work. *Three periods. Second term.*

4. *Seeds*.—Quality, preservation, and germination. Judging of corn, wheat, oats, etc., and a study of the market grades of field crops; shrinkage of grain and care of stored crops; vitality and germination; identification of weed seed and adulterants in grass seed. Largely laboratory work. *Two periods. First term.*

5. *Farm Equipment*.—Laying out the fields; the location, arrangement, design construction, and cost of farm buildings, especially barns, granaries, silos, etc.; the adaptability, efficiency, construction, operation, and durability of field and farm power machinery; the different kinds of fences, cost, construction, and durability; construction of roads, walks, and drains. Lectures, recitations, and practice work. *Three periods. Second term.*

Horticulture.

The aim of the Horticultural Department is to train young men in the fundamental principles of fruit and vegetable growing. The department has recently had placed at its disposal about 50 acres of land upon the College Farm. The lessons to be drawn from the orchards, gardens, and vineyards that will be planted in 1908 will be presented in the class room. The College is situated so near the orchards and markets of the State that unusual facilities are offered for study of the many phases of Horticulture. Numerous trips to orchards, markets and greenhouses will be planned as the occasion demands.

I. *Plant Propagation*. A discussion of the principles governing the propagation of plants, by seed, budding, grafting, layering, and cutting.

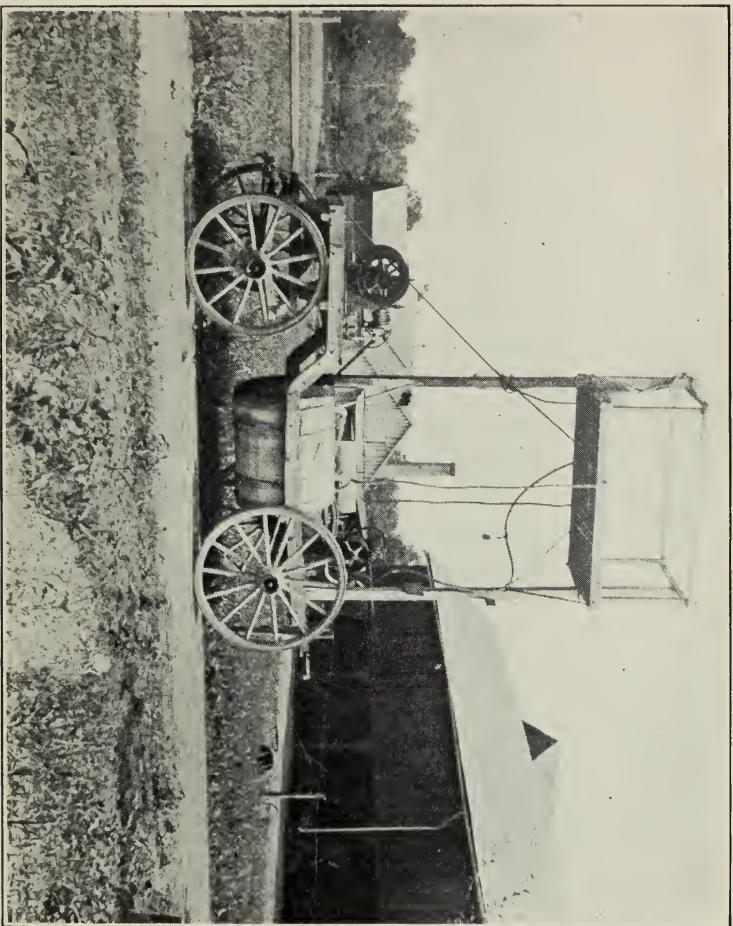
Lectures, text book, and practicums.

Two lectures and one practicum per week.

II. *Olericulture*. (Vegetable Gardening) A study of the location of gardens and truck farms, requisites of soil, fertilizers, and cultivation. The management of hot beds and cold frames.

Two Lectures and one practicum per week.

III. *Pomology*. A study of principles underlying successful commercial orcharding. Selection of site and soil, cultivation, fer-



THE COST OF SPRAYING IS THE PREMIUM PAID UPON A PERFECT FRUIT INSURANCE POLICY.
THE SUCCESSFUL ORCHARDIST USES A MODERN POWER SPRAYING OUTFIT

tilizing, pruning, and planting the orchard. Lectures and text book.

IV. *Floriculture*. Principles of construction and management of greenhouses. The growing of roses, carnations, and violets. How to grow vegetables under glass. Lectures and text-book. Two Lectures and one practicum per week.

V. *Harvesting and Marketing of Fruits*. A discussion of the methods of handling fruit and vegetables for market ; the package ; the commission man ; shipping associations ; the railroads ; and by products. Lectures and text-book. Two lectures per week.

VI. *Landscape Gardening*. The principles of ornamental gardening, planning and making of lawns, grouping of shrubbery. Comparisons of formal and naturalistic styles of gardening. Text-book and lectures. Two lecturers per week.

VII. *Plant Breeding*. The laws underlying the evolution and improvement of plants. Laws of hybridization and crossing. Fixation of character. Manipulations of hybridizing and crossing. Text-book, Lectures, and reference work. *Three periods per week*.

Forestry. A course dealing with the elements of Forestry. Raising the Forest ; Care and Protection of the Forest. Use of the Forest. The farm Wood-lot. The Forest as a Protective Agent. Studies of our common trees.

Special attention will be given to the farm wood lot.
One term, three periods per week.

Forestry 2 hours. (Elective).

Forest Mensuration.

Forestry 3 hours. (Elective).

Sylvics.

Courses 2 and 3 will be given by special arrangement with the Professor in charge.

1. GENERAL BOTANY. A general course covering the elementary principles of plant morphology, anatomy, and taxonomy of thealgae, fungi, hepaticae, and pteridophytae. This study will be made from types, and as much attention as possible will be given to related forms. *Two laboratory periods and one lecture per week during first term.*

2. *A continuation of course 1* A morphological and anatomical study of the phanerogams. A study of seeds and their germination followed by a careful, systematic study of the local flora. *Two laboratory periods and one lecture per week during second term.*

3. PLANT PATHOLOGY. A systematic and morphological study of the types of the various groups of fungi, with special reference to those which are known to cause plant diseases. Also of the bacterial diseases of plants. This will be followed by a study of the principles of treatment. Courses 1 and 2 are required of students in this course. *Two laboratory periods and one lecture per week during first term.*

4. *Continuation of course 3. Two laboratory periods and one lecture per week during second term.*

5. PLANT MORPHOLOGY. A study of the morphology of the higher plants, with special attention to the methods of preparing material for microscopical study. Courses 1 and 2 are required of students in this course. *Two laboratory periods and one lecture per week during first term.*

6. *Continuation of course 5. Two laboratory periods and one lecture per week during second term.*

Veterinary Science and Bacteriology.

Veterinary Science. Instruction in this subject will consist of lectures, recitations, class-room and out-door demonstrations.

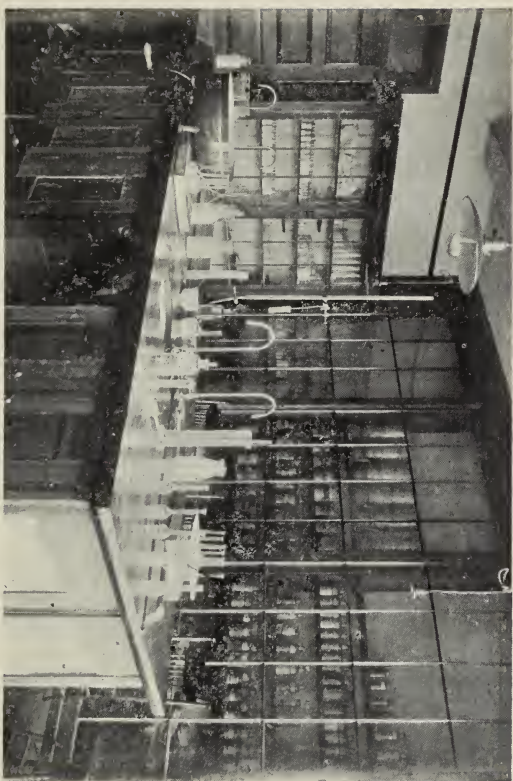
The common diseases of farm animals, management and hygiene, rules for the prevention of disease, methods of administering medicines, treatment of minor ailments, wound treatments, management of labor cases and examination for soundness, will be thoroughly taught by didactic instruction and by actual cases as they occur. The resources of the Experiment Station farm will be drawn upon to furnish much of this material for instruction.

The common parasites, such as the mange mites, lice, ticks, warbles, etc., will be described, and remedies for the diseases they produce, given.

Of the infectious and contagious diseases, tuberculosis, anthrax, and glanders will be duly described, as well as the method of preparing anthrax vaccine, and the test substances tuberculine and mallein, for tuberculosis and glanders. These substances will be prepared as a part of the student's work so he will feel a working familiarity with them and the uses to which they are put.

Sufficient anatomy and physiology will, of necessity, be introduced into the course to make the other instruction more comprehensible.

Text Book: Reynolds' "Veterinary Studies."



THE AGRICULTURAL LABORATORY

Bacteriology.

Instruction in this subject will consist mostly of laboratory exercises. Sufficient didactic instruction will be given to help the student understand the work in hand. He will learn how to prepare culture media, to isolate, stain, and mount bacteria, and to examine them under the microscope. The first forms studied will be the harmless ones, and, after sufficient grasp of the subject has been obtained, the disease-producing forms will be studied in artificial cultures. Then, their disease-producing properties in animals will be demonstrated.

Text Book : Abbott's Principles of Bacteriology.

Agricultural Chemistry.

The Chemistry of Plant Life ; of Soils ; of Fertilizers ; of Foods and Feeding Stuffs ; of Milk and the Dairy, with practical milk testing, including the detection of adulterants ; and of Fungicides, and Insecticides including practical tests.

Lectures, with reference books and Laboratory practice. One year, three periods a week.

Animal Husbandry.

1. *The Breeds and Types of Live Stock.* A study of the history, development, characteristics, and adaptation of cattle and swine.

Recitations and lectures *twice a week.* Exercises in judging *one afternoon a week.*

2. *A course similar to the above,* devoted to the study of horses and sheep.

3. *Principles of Breeding.* A study of the more important principles of Heredity, Environment, and care in their application to breeding farm animals. *Recitations and Lectures twice a week. Practice in pedigree work once a week,*

4. *Feeding farm Animals.* A study of the principles of Animal Nutrition, the composition of feeding stuffs, and effect upon and value to the Animal. The calculating of rations based upon the needs of the animal, as well as its economy.

Recitations and Lectures *twice a week.* Practice in calculating rations and examining feeding stuffs *once a week.*

5. *Special Problems in Stock Feeding.* By appointment, *three hours a week.*

Farm Practice.

In order that the students in Agriculture may familiarize themselves with the care and management of a farm so that they may know from actual experience how all kinds of farm work should be done, students in the first two years of either of the four year courses, or in the two year special course, will be required to work fifteen hours per week on the farm. For this work, which is primarily instructional, they will be paid at the rate of ten cents per hour.

Requirements for Admission.

Candidates for admission to the four year Collegiate course leading to a degree must be at least sixteen years of age, able to present satisfactory evidence of good moral character, and comply with the requirements for admission as presented in the College catalogue.

There are no qualifications for admission to the other three courses, save that the candidate be at least sixteen years of age, and of good moral character.

Positions After Leaving College.

While it is distinctly understood that the College does not guarantee to find positions for those who have attended its courses in Agriculture, every effort will be made to assist those who are worthy to find congenial positions at satisfactory remuneration.

Expenses for the Year.

Tuition is free to all students from Delaware.

Heat for Recitation Room	\$5.00
Janitor's services for care of Recitation Room, etc.	6.00
Use of Library	2.50
Printing, Stationery and other incidentals	4.00
Electric Light for Libraries, Work-Shop Halls, etc.	2.00
Gymnasium fee	2.00

\$21.50

For students rooming in the Dormitory there is an additional charge for the following items:



THE MACHINE SHOPS

Rent of Room in Dormitory (two in room) each	\$10.00
Heat of room	10.00
Janitor's services for care of Room	6.00
	— — —
	\$26.00

In addition to the foregoing charges, each student, upon entering the College, will pay \$5.00 as an entrance fee.

Students in Chemistry are charged a fee of \$3.75 a term for such articles as are consumed in making experiments.

Students in each of the Laboratories of Botany and Zoology pay an annual fee of \$2.50 for the cost of material used.

In the work-shop students are charged for the material used.

Each student is required to pay to the Treasurer of the College \$5.00 at the beginning of each collegiate year, which fund shall be used to repair any damage done to College property. Each student occupying a room in the Dormitory shall be charged with the repair of any damage done in the room which he occupies.

This is the nature of a guarantee fund and any part of it that is unexpended at the end of the year is placed to the credit of the student paying the same. At the opening of the next year each student is required to add a sufficient amount to any sum that may be remaining from the previous year to make it five dollars as at first. When a student withdraws from College the part of the fee that is unexpended shall be refunded to him.

Damage done to the halls and other parts of the buildings will be divided among all the students occupying the buildings.

The students rooming in the College dormitory have formed an association, in which board is served at cost of provisions and service.

Students furnish their rooms and pay for electric light at cost to the College. They provide themselves with books and stationery.

PAYMENT.—*College bills for each term are due and payable in advance.*

All arrears must be paid or provided for before a graduating student receives his diploma.

UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

UNIVERSITY OF ILLINOIS-URBANA



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